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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,680	07/28/2003	Thomas P. Krauss	CML01070M	4497
7590 12/13/2004				
KENNETH A. HAAS Motorola, Inc. - Law Department 1303 E. Algonquin Road Schaumburg, IL 60196			EXAMINER HAILE, FEBEN	
			ART UNIT 2663	PAPER NUMBER

DATE MAILED: 12/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/628,680

Applicant(s)

KRAUSS ET AL.

Examiner

Feben M Haile

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-15, 17 and 18 is/are allowed.
- 6) ☒ Claim(s) 1-4 and 16 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>07.28.2003</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This claim discloses a pilot stream being spread and then time shifted but figure 5 teaches a pilot stream being spread, and then added to another stream before being time shifted.

### ***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Jones et al. (US 6,108,317), hereinafter referred to as Jones.

**Regarding claim 1**, Jones discloses the limitations: de-multiplexing a data stream to produce a plurality of de-multiplexed data streams (figure 7B1 units 464, 508 & 510 and see column 17 lines 58-62), spreading de-multiplexed data streams with a spreading code to produce a plurality of chip streams (figure 7B1 unit 476 and see column 18 lines 15-19), time shifting each chip stream by a predetermined amount (figure 7B1 unit 530 and see column 18 lines 20-25), and transmitting each time-shifted chip stream on a predetermined subcarrier (figure 7B1 units 480 & 544 and see column 18 lines 39- 42).

**Regarding claim 2**, Jones discloses the limitations: step code multiplexing a spread pilot with the chip stream (figure 7B1 units 524, 526 & 446 and see column 18 lines 52-54).

**Regarding claim 3**, Jones discloses the limitations: differing spreading codes are used for at least two of the de-multiplexed data streams (see column 18 lines 15-19).

**Regarding claim 16**, Jones discloses the limitations: a de-multiplexer, de-multiplexing a data stream to produce a plurality of de-multiplexed data streams (figure 7B1 units 464, 508 & 510 and see column 17 lines 58-62), a spreader, spreading the de-multiplexed data streams with a spreading code to produce a plurality of chip streams (figure 7B1 unit 476 and see column 18 lines 15-19), a time shifter, time shifting each chip stream by a predetermined amount (figure 7B1 unit 530 and see column 18 lines 20-25), and a transmitter, transmitting each time-shifted chip stream on a predetermined subcarrier (figure 7B1 units 480 & 544 and see column 18 lines 39- 42).

***Allowable Subject Matter***

3. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. Claims 6-15 & 17-18 are allowed.

The following is an examiner's statement of reasons for allowance:

**Regarding claim 6**, the prior art fails to disclose the limitations “for a first transmission interval, mapping a first chip of a spread symbol to a predetermined subcarrier; and for a second transmission interval, mapping the first chip of a spread symbol to a second subcarrier, wherein the second subcarrier differs from the first subcarrier”.

**Regarding claim 10**, the prior art fails to disclose the limitations “despreading the chip stream with a pilot code during a first symbol period to produce a first channel estimate for the first symbol period; despreading the chip stream with the pilot code during a second symbol period to produce a second channel estimate for the second symbol period; generating a third channel estimate only for a portion of the first symbol period based on the first and the second channel estimates; and generating a fourth channel estimate for a second portion of the first symbol period based on the first and second channel estimates”.

**Regarding claim 17**, the prior art fails to disclose the limitations “a mapper, for a first transmission interval, mapping a first chip of a spread symbol to a predetermined subcarrier and for a second transmission interval, mapping the first chip of a spread symbol to a second subcarrier, wherein the second subcarrier differs from the first subcarrier”.

**Regarding claim 18**, the prior art fails to disclose the limitations “a channel estimator, despreading the chip stream with a pilot code during a first symbol period to produce a first channel estimate for the first symbol period, and despreading the chip stream with the pilot code during the second symbol period to produce a second

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channel estimate for the second symbol period; and an interpolator generating a third channel estimate for a portion of the first symbol period based on the first and the second channel estimates and generating a fourth channel estimate for a second portion of the first symbol period based on the first and second channel estimates”.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a) Tong et al. (US 2001/0038630), Multi-Carrier Arrangement for High Speed Data
- b) Ma et al. (US 2003/0072254), Scattered Pilot Pattern and Channel Estimation Method for MIMO-OFDM Systems
- c) Cimini et al. (US 5914933), Clustered OFDM Communication System
- d) Sarraf et al. (US 6747948), Interleaver Scheme in an OFDM System with Multiple-Stream Data Sources

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Feben M Haile whose telephone number is (571) 272-3072. The examiner can normally be reached on 8:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



RICKY NGO  
PRIMARY EXAMINER